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ATTENTION DEFICIT DISORDER
WITH HYPERACTIVITY

1991

Donna S. Field
Boston College
Research Proposal

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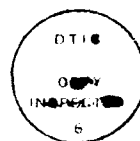
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Conners' Abbreviated Parent Questionnaire (Goyette, Conners & Ulrich, 1978) and the Home Screening Questionnaire (HSQ, Barkley, 1981) were utilized. The Conners' Scale gives a summary score or Hyperkinesis Index. The HSQ (Barkley, 1981) was developed to assess situational variation in children's behavior. The HSQ provides two summary scores. The number of problem situations is an index of the total situational diversity of problem behaviors for a given child. The mean severity score is an index of the severity of problem behaviors across situations.

The children who received the combined intervention approach (44%, n=4) overall had lower scores for the Hyperkinesis Index and lower mean scores on the HSQ than children who received stimulant medication as their primary intervention (22%, n=2).

The findings suggest that within this sample population, children treated with a combined approach of medication, counseling and environmental modification have better outcomes than when stimulant medication is utilized as the primary intervention.

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Introduction

Attention deficit disorder with hyperactivity is one of the most common behavioral disorders in children in the United States (American Psychiatric Association, 1987). Despite its high incidence, treatment is controversial because of concern over medication use (Wolraich, et al., 1990).

Problem Statement

The purpose of this research study is to study and compare the long term outcomes of children treated with stimulant medication compared to treatment with a combined approach of medication, environmental intervention and counseling.

Significance

Hyperactivity is the most frequent psychological referral to mental health and pediatric facilities. It is estimated that three percent to five percent of elementary school children have attention deficit disorder (Ross & Ross, 1982; Taylor, 1986). Attention deficit disorder with hyperactivity (ADHD) is more frequent in boys, has its greatest incidence before age 7 and tends to be less frequent with fewer episodes in adolescence (APA, 1987).

Definition

The essential features of ADHD are, "developmentally inappropriate degrees of inattention, impulsiveness and hyperactivity (APA, DSM III-R., 1987). People with the

disorder generally display some disturbances in each of these areas, but to varying degrees. The DSM-III R. (APA, 1987) criteria for Attention Deficit Hyperactivity Disorder (ADHD) include:

A. A disturbance of at least six months during which at least eight of the following are present:

1. Often fidgets with hands or feet or squirms in seat; in adolescents may be limited to subjective feelings of restlessness.
2. Has difficulty remaining seated when required to do so.
3. Is easily distracted by extraneous stimuli.
4. Has difficulty awaiting turn in games or group situations.
5. Often blurts out answers to questions before they have been completed.
6. Has difficulty following through on instructions from others (not due to oppositional behavior or failure of comprehension); e.g., fails to complete chores.
7. Has difficulty sustaining attention in tasks or play activities.
8. Often shifts from one uncompleted activity to another.
9. Has difficulty playing quietly.
10. Often talks excessively.
11. Often interrupts or intrudes on others.
12. Often does not seem to listen to what is being said to him or her.

13. Often loses things necessary for tasks or activities at school or home (e.g. toys, pencils, books, assignments).
14. Often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill seeking); e.g. runs into street without looking.

These items are listed in descending order of discriminating power based on data from a national field trial of the DSM III R. (APA, 1987) criteria for Disruptive Behavior Disorders.

B. Onset before age 7 years.

C. Does not meet the criteria for a Pervasive Developmental Disorder (APA, 1987).

An important aspect of hyperactivity is that it is a developmental disorder and deviation from age-appropriate normals is a component of the diagnosis. What normative data exist suggest that some of the behaviors listed in the DSM III-R. (APA, 1987) are common in young, elementary aged children. Ross and Ross (1982) discussed the need to develop clearer normative data on children's behavior, which would make it easier to determine where the hyperactive child actually deviates from normal development.

Conceptual Framework

Stress may be caused by any influence, internal or external which interferes with the satisfaction of a person's basic needs or disturbs the adaptive equilibrium.

Stress and adaptation theories view change due to person-environment interaction in terms of cause and effect. The person needs to adjust to these changes to avoid disturbing a balanced existence (Leddy & Pepper, 1985). Lazarus and Launier (1978) explained a person adapts by means of coping mechanisms which include efforts to master conditions of harm, threat, or challenge when an automatic response is not readily available.

Selye's theory of stress (1978) focuses on physiologic responses to acute stressors. Regardless of which stressors are involved the individual responds with the same generalized changes called the general adaptation response. The general adaptation response occurs in three stages. The first stage is an initial stage of shock or an alarm reaction, followed by a period of increasing resistance or adaptation. If the body's response is not adequate to control the stressors, it enters a stage of exhaustion. The reaction continues and as defenses are depleted, death occurs. If resistance is adequate, the body returns to a state of balance. (Selye, 1978).

Lazarus and Launier (1978) emphasized how people cope with stress may be more important to overall morale, social functioning and health/illness than the frequency and severity of episodes of stress themselves.

Hall and Weaver (1977) suggested adaptation depends on the ability of the individual to develop personal mastery over the environment. Health can be maintained by reducing stress or promoting coping responses. Coping responses may influence

whether or not situations are perceived as threatening to a given person.

Use of stress and adaptation theories to guide the nursing process are most applicable to assessment of physiologic stressors and adaptation responses. The goal of intervention is the support of body defenses with a reduction of additional stress (Leddy & Pepper, 1985).

The average child's environment includes many stress-inducing factors including society in general, home and school. Children may not be able to cope with stress as well as adults. (Humphrey, 1984).

Stress in children may involve both personal and self concerns. Some of these factors are listed below: (Humphrey, 1984, p. 4-5).

1. Self concerns associated with meeting personal goals.
Stress is likely if adults set goals for children that are too difficult for them to accomplish.
2. Self concerns which involve self esteem. This is the way one feels about oneself. One's self esteem can often be related to fulfillment of certain ego needs.
3. Self concerns related to changing values. It is frustrating to some children if they do not understand the system of values imposed on them in a given school or home environment.
4. Self concerns that center around social standards.
5. Self concerns involving personal competence and ability.

6. Self concerns about their own traits and characteristics.

Children with hyperactivity have a disorder that can negatively affect almost every aspect of their lives, including family relationships, friendships and learning. Children with ADHD are often quite difficult to deal with and they can place a great deal of stress on the family. This stress can cause strain in marital relationships and overall family interaction. Often the entire family needs help in coping with problems that result in having a family member with hyperactivity. Parents often experience a great deal of guilt relative to the hyperactive child's social and emotional difficulties. Parent counseling may be an excellent way to cope with these guilt feelings and learn more effective methods to deal with the symptoms of hyperactivity (Nussbaum & Bigler, 1990).

Hall and Weaver (1977) state widespread reduction of stress is an unlikely goal. Support systems can provide a powerful means to maintain health, despite the pressures of society. Families seek to provide for the physical, psychological and cultural needs of their members. Nursing assists families in the attainment of optimum family relationships and family functioning. In addition, nursing can help families achieve a balance that respects the personal growth needs of all family members by carrying out nursing interventions that enhance role development. Families with an at risk or handicapped child are particularly vulnerable to potential health problems. Nursing seeks to monitor them and provide

protective intervention either independently or collaboratively.

Review of the Literature

Cantwell (1979) stated the first informal description of hyperactivity was published in 1845 in Der Strumwelpeter, a collection of moral tales for children written by a German physician, Heinrich Hoffman. One of the characters was "Fidgety Phillip", who was described as restless, naughty, rude and wild.

Attention Deficit Disorder is the more recent description of the minimal brain damage concept that began in the 1920's. Inattention, impulsivity and high activity were thought to result from brain malformation, either from injury or genetically determined (Cantwell, 1979; Corey, 1988). It was redefined to minimal brain dysfunction in the 1960's. Much of the argument for the concept of "Minimal Brain Dysfunction" has been rejected. Rutter (1989) stated all biological findings failed to establish the validity of a Minimal Brain Dysfunction syndrome.

The DSM III (APA, 1980) changed the focus of attention deficit disorder, it replaced the previous diagnosis of Hyperkinetic Reaction (Hyperactivity, Minimal Brain Dysfunction). According to this definition a child would be considered to have attention deficit disorder if he/she demonstrated defects of: sustained attention, impulsivity and motor hyperactivity.

The publication of the revised DSM III in 1987 (APA) again redefined hyperactivity. The criteria differ from those in the earlier DSM I-III edition in:

1. Having a single list of symptoms instead of a listing

of items under each symptom.

2. The cut off score of 8 or 14 items was established in a clinical trial.

3. The condition of Affective Disorder no longer excluded the diagnosis. The disorder is now referred to as Attention Deficit-Hyperactivity Disorder (ADHD). The subtyping into groups with and without hyperactivity was eliminated. (Barkley, 1988).

Lahey and colleagues (1988) stated the use of a unidimensional model for ADHD created confusion regarding the DSM III category of ADD without hyperactivity. Some children receiving the diagnosis will have eight or more symptoms of ADHD and could be given this label even though they show no symptoms of motor hyperactivity. However, a tentative diagnostic category, undifferentiated attention deficit disorder was added to the DSM III-R. This category is provided for children with problems in attention only (APA, 1987).

The DSM III-R. criteria for the diagnosis of ADHD are descriptive. Onset before age 7 years is required, as is a minimum duration of symptoms for six months. Of fourteen specified behaviors, a child must have eight or more, all compared to what is expected of normal children the same age. In descending order of discriminating power the behaviors include:

1. Has difficulty remaining in seat when required to.
2. Often fidgets with hands or feet or squirms in seat.
3. Has difficulty playing quietly.
4. Often shifts from one uncompleted activity to another.
6. Has difficulty sustaining attention to tasks and playing

activities.

7. Has difficulty following through on instructions from others (not due to oppositional behavior or failure of comprehension) e.g., fails to finish chores.
8. Is easily distracted by extraneous stimuli.
9. Often interrupts or intrudes on others, e.g. butts into other children's games.
10. Often blurts out answers to questions before they have been completed.
11. Has difficulty waiting turn in games or group situations.
12. Often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill seeking) e.g. runs into the street without looking.
13. Often loses things necessary for tasks or other activities at school or home (e.g. pencils, books, assignments).
14. Often does not listen to what is being said to him or her (APA, 1987).

Lahey and colleagues (1988) did a cluster analysis of 667 children with ADHD and demonstrated three distinct groups of children: 1. children with ADD 2. children with both inattention and hyperactivity and 3. a group with inattention and sluggish tempo but not hyperactivity. Their results were inconsistent with the decision in the DSM III-R. (APA, 1987) to consider all symptoms of ADHD as one dimensional. Healy (cited in Lahey et al., 1988) reported that no studies are available to determine whether children without hyperactivity do or do not have different long term prognoses or if they respond differently to treatment.

Edelbrock, Costello and Kessler (1984) found children with ADD without hyperactivity had more academic failure. The ADD group was described by teachers as less happy while ADHD boys were rated as more unpopular, self-destructive and aggressive.

Many studies have shown ADHD children are different from

normal children in measures of attention span, activity levels and impulse control (Ross & Ross, 1982; Whalen & Henker, 1980).

For the purposes of this study, attention deficit-hyperactivity disorder (ADHD) will be defined in terms of the DSM III-R. (APA, 1987) criteria. Affected children usually have difficulty in all three areas of attention, activity and impulse control. For the diagnosis to be made, the behavior must occur more frequently than that seen in most children of the same age.

Related Characteristics

Children with ADHD have been found to experience many cognitive, academic, emotional, social and physical problems associated with their ADHD (Barkley, 1988). These children are more likely to also have decreased self esteem, depression and poor peer acceptance (Pelham & Bender, 1982; Weiss, 1985). Children with hyperactivity have considerable conflicts in their social interactions, whether with parents, teachers or peers (Barkley, 1988). These children are described as less compliant, more oppositional and less able to sustain compliance with tasks than normal children.

Incidence

Accurate estimations of ADHD are difficult due to variations in definitions. Prevalence estimates range from a low of one percent to a high of twenty percent in the school age population (Johnson, 1988; Barkley, 1988). A generally cited figure is

three percent to five percent (APA, 1980). Boys are reported to have ADHD more than girls with rates of 4:1 to 9:1 across studies. Barkley (1988) found a ratio of 3:1 is more typical of the general population with hyperactivity.

Etiology

Although no single cause has been proven, ADHD is thought to be multifactorial (Barkley, 1988). Brain disorder was initially thought to be a primary cause of ADHD but more recent research suggests that fewer than five percent of children have definite evidence of neurological damage. ADHD has been attributed to a number of gestational and noxious factors including lead poisoning, birth complications (prematurity, trauma or anoxia), temperament, child-rearing practices, diet and allergic reactions.

There is an increased incidence of hyperactivity in parents of hyperactive children compared to controls. Other studies show a high concordance of hyperactivity in monozygotic twins compared to dizygotic twins (Shaywitz & Shaywitz, 1984). These investigators also found an increased incidence of ADD in siblings of girls with ADD. Shaywitz and Shaywitz suggest that although girls are affected less frequently with ADD, when they are affected their genetic loading is high.

Zametkin and colleagues (1990) investigated cerebral glucose metabolism in normal adults and adults with histories of hyperactivity in childhood who continued to have symptoms. Each adult studied was the parent of a hyperactive child. None of

the adults had ever been treated with stimulant medication. Positron-emission tomography (PET) of the brain was utilized as a measurement of regional glucose metabolism. These investigators found global cerebral metabolism was 8.1 percent lower in the hyperactive patients and was significantly reduced in the premotor cortex and superior prefrontal cortex--areas earlier shown to be involved in the control of attention and motor activity.

Weiss (1990) in a commentary of Zametkin et al., (1990) study emphasized it would be premature to conclude that the underlying cause for ADHD is now established. It will be important to determine whether the hyperactive adults constituted a distinct subgroup. It will also be important to study whether stimulant drugs affect the reduction in cerebral glucose metabolism.

Weiss (1990) stated it is likely that ADHD has no single cause, but represents a final common pathway of various interacting biologic and psychosocial variables. The relative importance of pathogenic variables may vary from child to child. Dysfunction in the brain may be important but not essential determinant of the disorder that interacts with psychosocial variables.

Much research related to ADHD has focused on attempts to delineate biologic causes with many studies concentrating on differences between children with ADHD and normal children in the metabolites of neurotransmitters. Dysfunction in the adrenergic and serotonergic systems has been hypothesized but

not proven. This would account for the demonstrated efficacy of stimulants in decreasing symptoms of ADHD, as they are known to be agonists of the adrenergic transmitter system. Although, it is known that genetic factors play a part, the nature of genetic transmission is not known. In some children with ADHD, high levels of lead have been found in the blood. Psychosocial factors such as poverty and chaotic family life are often present. (Weiss, 1990, p. 1413).

Conrad (1977) described children with hyperactivity utilizing a sociological approach. He stated children were labeled or categorized based on others' behavioral reports and observations. Hyperactivity is perceived as a behavior which differs from the normative expectations of society. It is viewed as a relative rather than an absolute phenomenon. The social system approach to hyperactivity is presented by Conrad as a contrasting model to the medical-clinical model. He suggested the pathology may be in the system itself and that it may need remediation.

The diagnosis of ADHD is made on the clinical profile of the child based on the initial visit. The complete assessment must include information provided by the child, parents and teachers. There is no single test that establishes the diagnosis of ADHD. EEG and CT scan appear to have no role at this time.

Sensory impairment, particularly auditory, should be assessed in all children who present with difficulty concentrating. Gascon, Johnson and Burd (1986) noted all the children they studied with ADHD also had significant difficulties

in central auditory processing. These children demonstrate poor discrimination skills, repeatedly misunderstand what is said and repeatedly ask for repetition. An important first step in modifying their environment is to reduce extraneous noise and distracting stimuli as much as possible.

Treatment

A number of approaches in the treatment of ADHD have shown varying degrees of success. Some of the treatment methods include: 1. medication 2. environmental modification (including educational approaches in the classroom) and 3. behavioral management/counseling (Nussbaum & Bigler, 1990).

Stimulant medications have achieved consistent, well validated results in the treatment of ADHD for over 50 years (Johnson, 1988; Baren, 1989). The medications most frequently used include methylphenidate (Ritalin), dextroamphetamine (Dexedrine) and pemoline (Cylert). While dextroamphetamine and methylphenidate have comparable effects many investigators believe methylphenidate produces fewer side effects and is the drug of choice (Shaywitz & Shaywitz, 1984). Pemoline is considered a second line drug due to possible hepatic adverse effects.

In children with ADHD, methylphenidate decreases motor activity, prolongs attention span and produces mild dysphoria (Smitherman, 1990).

The effectiveness of methylphenidate has been described as the most dramatic chemotherapeutic effect in child

psychiatry (Smitherman, 1990). With treatment, 60 to 90 percent of children who have ADHD are significantly better able to concentrate, stay with a task and control impulsivity in situations which require this behavior (Barkley, 1977).

The primary side effects observed with stimulants include insomnia, anorexia, weight loss or irritability. These side effects appear to be transitory and tend to disappear with a reduction in drug dosage (Barkley, 1977).

Amery, Minichello and Brown (1984) found that dextro-amphetamine in low doses had an anti-aggressive effect on boys with ADHD.

In a similar study using methylphenidate, the children demonstrated decreased aggression as well as decreased inattention and impulsivity (Klorman, Brumaghim, Strauss, Borgstedt & McBride, 1989).

McBride (1988) found that 69 percent of ADHD children showed improved school and behavior responses when receiving methylphenidate.

Although not sufficient by themselves to ameliorate the many difficulties of children with ADHD, stimulant medications can be an indispensable part of the total treatment program for children over five years of age with moderate to severe ADHD (Barkley, 1988).

Barkley and Cunningham (1979) studied twenty hyperactive boys to determine the effects of methylphenidate on mother-child interactions. They found children receiving methylphenidate were more compliant during medication treatment. However, the

boys receiving methylphenidate initiated fewer social interactions and tended to be less responding.

Ullman and Sleator (1985) studied 86 children diagnosed with ADD and ADHD. Double blind and drug-placebo trials were utilized. They found the greatest improvement on stimulant medication occurred in attention, followed closely by hyperactivity. Social skills and oppositional behavior did not improve with the use of stimulant medications. The investigators emphasized the need for further research to evaluate other methods, not entirely dependent on medication for altering undesirable behavior.

Safer and Krager (1986) studied elementary school children receiving medication for ADHD and noted an increase of 1.07 to 5.96 percent between 1971 and 1976 (in Baltimore County, MD). Between the years 1975 and 1987, the percent of public middle school children receiving medication for ADHD rose from 0.5 percent to 3.68 percent. During this sixteen year period, of the stimulants prescribed, methylphenidate increased from 40 percent to 93 percent, while dextroamphetamine decreased from 36 percent of the total to 3 percent. Pemoline's use has varied within a 1 percent to 6 percent range.

Wolraich, et al. (1990) conducted a study of treatment by family physicians and pediatricians. They found that while methylphenidate was the primary therapy for ADHD, overuse was not a problem. Other findings included difficulty in making a definitive diagnosis of ADHD. Parents or teachers concurred with physician diagnosis (DSM III-R.) in nearly four out of

five children but disagreed with each other on symptoms in more than half. Also found was decreased use of behavioral intervention. Stimulant medication did reduce impulsiveness, distractability and activity. However, behavioral therapy teaches parents how to help their children gain better control over their behavior so that they are less often out of control.

Barkley (1977) also emphasized the results of follow up studies suggest that stimulant medication is not a panacea for treating hyperactivity. While these drugs seem to facilitate short term management of hyperactive children they have little impact on the long term social, academic or psychological adjustment of these children.

The American Academy of Pediatrics Committee on Children with Disabilities/Committee on Drugs reviewed stimulant medication in children with ADHD (1987). Drug therapy is considered by some to be a cure all for children with ADHD. Unfortunately, some children are treated for long periods of time without adequate diagnostic evaluation or follow up. Medication for children with ADD or ADHD should not be used as an isolated treatment. Proper classroom placement, behavioral modification, counseling and providing structure should be used before a trial of medication has been started (AAP, 1987).

Cantwell (1979) stated that while stimulant medication will generally correct the underlying attention disorder, it will not do anything for the secondary problems the child may have developed. "A frequent and serious mistake is to assume that because the drug has eliminated the more obvious and

troublesome symptoms, such as fidgeting and disruptive behavior that nothing else needs to be done." (Cantwell, 1979, p. 73).

Werry (1981) also supported the use of stimulant medication as part of the comprehensive treatment plan. These medications should be viewed as an adjunctive therapy that enables the child to respond more favorably to behavioral management and special education strategies.

Scroufe and Stewart (1973) stated the use of stimulant medication in isolation is contraindicated, since the use of drugs may actually lower the motivation of parents and teachers to take other steps to help the child.

The hyperactive child should be in an environment that is minimally distracting and disorganized. A well-structured, environment is preferred with clear and consistent demands to the child. A self contained classroom with a small teacher-to-student ratio is optimal and an open classroom is contraindicated. Other distracting factors such as bright colors, windows opening into playgrounds and cluttered desks or shelves should be avoided (Dworkin, 1985).

Dubay, O'Leary and Kaufman (1983) found parents presenting in behavior modification training rated their children as more improved than parents of similar groups without this training. In the majority of cases, multiple interventions led to better outcomes than one intervention alone. Children with ADHD have many needs (behavioral, cognitive, social and emotional) requiring combined interventions. Generally, the treatments

are selected according to the apparent needs of each child and family (Johnson, 1988).

Behavioral management techniques are of major importance in the approach to hyperactive children. Wolraich (1979) reviewed 157 studies using behavioral modification in hyperactive children. Although long-term benefits beyond one year have not yet been assessed, studies indicated that therapy is effective in alleviating problem behaviors. Wolraich noted the effects of behavioral modification and stimulant medication appeared to be additive. Thus, for the child not optimally improving from a behavior therapy approach, medication may be used as adjunctive therapy.

Behavior modification has come to represent the most widely used alternative to medication. Evidence from studies in both experimental and regular classrooms have demonstrated its effectiveness. Whether or not it is superior to medication is controversial (Shaywitz & Shaywitz, 1984). In some studies the effects of behavioral modification and medication are comparable (Shaywitz and Shaywitz, 1984).

Hechtman, Weiss, Perlman and Amsel (1984) conducted a ten year prospective study of 17-24 year olds diagnosed with ADHD to determine which factor or groups of factors (at ages 6-12 years) can predict adult outcome. Their results included the following parameters as most important: family socioeconomic status, mental health of family members and personal characteristics such as IQ, aggressiveness, emotional instability and low frustration tolerance. Initial IQ was related

to grades completed and socioeconomic status was related to academic standing and grades failed.

Hechtman, Weiss and Perlman (1984) observed adolescents, even those treated with stimulant medication in childhood, have significant academic difficulties. They continue to have problems with restlessness, impulsivity, concentration and immaturity. In many adolescents, this is accompanied by poor self confidence and poor self esteem and close to 25 percent are involved in significant antisocial behavior (Hechtman et al., 1984).

Klorman, Coons, Brumaghim, Borgstedt and Fitzpatrick (1985) found many adolescents presented with antisocial disorders in addition to residual ADHD.

Hechtman, Weiss and Perlman's (1984) study suggested that while stimulant medication for hyperactive children may not eliminate educational, work, or life difficulties, it may result in less social isolation and improved feelings about themselves and others.

The longer attention deficit disorder is left untreated, the more serious and intractable are its likely secondary consequences. "As with other areas of medicine, prevention is not only better but simpler and cheaper than cure. We cannot, to be sure, literally prevent attention deficit disorder but by clinical alertness and timely intervention we may be able to prevent or head off the sequelae that make its victim a burden to society and to himself." (Cantwell, 1979, p.73).

In conclusion, in the majority of cases multiple interventions are required in treating the diverse difficulties

of ADHD children and their families (Barkley, 1988). These often include parent training in child management skills, classroom management programs, home-based reinforcement systems, self-control training for older children and stimulant medication. "While initial interventions are short term, periodic reintervention is often necessary as children develop and display new problems commensurate with parental and societal demands of later developmental stages and the children's inability to meet these demands adequately. Assessment and intervention are, therefore, closely intertwined in an ongoing process." (Barkley, 1988, p. 98).

Design

This nonexperimental retrospective study was designed to determine the long term outcomes of children treated with stimulant medication compared to a combined approach of stimulant medication, environmental intervention and counseling.

Subjects and Sample selection

The subjects for this study were selected through the patient records at the Shriver Center. A convenience sample was selected from records reviewed from 1985 through 1989.

Basic demographic information was obtained from the ten parents who elected to participate in the study (see appendix, table I). The majority of participants were mothers who completed the survey, representing 90 percent ($n=9$) of the sample. One father completed the survey, representing 10 percent of the

participants. Maternal ages ranged from 30 to 46 years, with a mean of 39.3 years. Paternal ages ranged from 31 to 45 years, with a mean of 41 years.

The families surveyed were well educated with 60 percent of the fathers being college graduates. Fifty percent of the mothers were college graduates. The majority of fathers were currently employed (90%) while 50 percent of the mothers reported employment outside the home.

The children studied were all boys. Their ages ranged from five to twelve years, with a mean of 8.6 years. The grade level in school ranged from kindergarten to sixth grade.

Only those children, ages five to twelve years with a diagnosis of ADHD as established by the DSM III-R. criteria (APA, 1987) were considered for inclusion in the study.

Subject Recruitment

The parents of subjects were contacted by mail. They received a packet with a cover letter explaining the study's purpose as well as instructions for completing the two questionnaires. Outcome since last evaluation at the Shriver Center and recommended treatment for the children were included in the packet (see appendix). Stamped self-addressed envelopes were provided. Thirty-two packets were mailed and six were returned as undeliverable by the post office. Return rate was 38 percent.

Instruments

The most commonly used rating scales in research with ADHD

children have been the Conners' Parent and Teacher's Rating Scales (Goyette, Conners & Ulrich, 1978).

Conners also developed an Abbreviated Parent/Teacher Questionnaire (Goyette, Conners & Ulrich, 1978). This questionnaire includes the ten most commonly endorsed items on the Parent and Teacher Questionnaire. The scale is brief and complete, so that it represents little response burden and can be administered repeatedly to document changes in behavior over time and in response to interventions (Edelbrock & Rancurello, 1985).

Each item on the Conners Abbreviated Rating Scale is scored 0,1,2 or 3 with a total score giving a hyperkinesis index. A score of 15 or greater has been shown to discriminate between children diagnosed as hyperactive and classroom controls. (Dworkin, 1985).

Evidence in support of the validity of the Conners' scales is widespread. Concurrent validity is supported by significant correlations with numerous other rating scales and criterion measures. Conners' scales have repeatedly been shown to discriminate between normal and hyperactive samples. (Edelbrock & Rancurello, 1985).

Satisfactory correlations of .94 and .92 have been found between the Conners' Abbreviated Rating Scale and the factor hyperactivity (Goyette, Conners & Ulrich, 1978).

Rating scales are useful in gathering information from informants with many years of experience with the child. They provide a means of obtaining perceptions of significant people

who are responsible for the child's care. Rating scales also address behaviors that are likely to be missed by observational assessments. They are relatively inexpensive and efficient in terms of time and resources (Barkley & Edelbrock, 1987).

Despite their advantages and widespread use, behavioral rating scales have several limitations. The most serious issue is the question of validity and accuracy of self reports (Polit & Hungler, 1987).

Barkley and Edelbrock (1987) believe one approach to the problem of validity and accuracy is to supplement the rating scales with behavioral observations in different settings. In this way, the advantages of each assessment method could be utilized.

Barkley's Home and School Screening Questionnaire (1981) was developed to assess situational variation in children's behavioral disorders. The Home Screening Questionnaire (HSQ, see appendix) lists sixteen different situations in which parents commonly observe and manage their child's behavior. Parents are asked to indicate (Yes or No) whether a problem behavior exists in any of the situations. If so, they rate the severity of the problem on a scale from 1 (mild) to 9 (severe).

The HSQ (Barkley, 1981) gives two summary scores. The number of problem situations is obtained by summing the total number of problem situations, and is an index of the total situational diversity of problem behaviors for a given child. The Mean Severity Score, is an average of severity ratings

for all situations rated as problematic, is an index of the severity of problem behaviors across situations. (Barkley & Edelbrock, 1987).

Preliminary findings regarding the reliability of the HSQ were derived from a double-blind, placebo controlled study of the effects of methylphenidate on twenty children with attention deficit disorder (Barkley & Edelbrock, 1987). Test retest reliability was estimated by correlating initial summary scores with summary scores from the placebo condition of the drug trial. For the HSQ, correlations between the initial and placebo assessments were .66 for the number of problem situations and .62 for the mean severity score.

In Breen and Barkley's study of a mixed population of normal, hyperactive and other psychologically disordered children (n=52) significant positive correlations were found between the HSQ and the Conners' Abbreviated Parent Rating Scale (Goyette, Conners & Ulrich, 1978), the Child Behavior Checklist and Parent Stress Index (cited in Barkley & Edelbrock, 1987).

Using the HSQ, Barkley (1981) compared thirty children with hyperactivity with thirty normal children. He found the hyperactive group demonstrated problems in significantly more situations and had significantly higher severity scores. The percentage of hyperactive children reported to exhibit problem behaviors was higher than normal controls in virtually every home situation.

Protection of Human Rights

Specific measures were taken to ensure the rights of

subjects who participated in this study are protected. This information was provided to each participant in the cover letter accompanying the questionnaires. Participation was considered voluntary and subjects retained the right to refrain from participation without fear of repercussion. Written consent was obtained. Individual questionnaires were not labeled with names so confidentiality would be ensured.

Results

Results from the Conners Abbreviated Parent Questionnaire (Goyette, Conners & Ulrich, 1978) and the HSQ (Barkley, 1981) and treatment intervention are provided in table II of the appendix.

One subject was omitted from further data analysis based on parent report of a questionable ADHD diagnosis. The Hyperkinesis Index was 10 (less than the cutoff of 15 for hyperactivity).

Twenty-two percent (n=2) received stimulant medication as their primary treatment for ADHD. Both were reported as improved by parents. The Hyperkinesis Index for each child was 26 and 18. The number of problem situations on the HSQ were 16 and 12. HSQ mean scores were 6 and 8.16.

Forty-four percent (n=4) received medication, psychotherapy and environmental modification (primarily smaller, more structured classroom). All four were reported as improved by parents. The Hyperkinesis Index for each child was 16, 27, 21 and 11. The number of problem situations on the HSQ were

12, 16, 15 and 11. The HSQ mean severity scores were 4, 8, 4 and 2.3.

Eleven percent (n=1) received environmental modification measures and counseling for hyperactivity. His parents also reported improvement in his behavior. The Hyperkinesis Index was 12 (after interventions were initiated). The number of problem situations on the HSQ were 6 and his mean severity score was 4.3.

Eleven percent (n=1) received modified classroom and environmental measures for hyperactivity. Parents reported improvement in behavior after interventions were started. The total number of problem situations on the HSQ were 2 and his mean severity score was 1.

Eleven percent (n=1) received modified environmental measures and stimulant medication. The Hyperkinesis Index was 19. The number of problem situations on the HSQ were 15 and his mean severity score was 5.73. Parents reported improvement in his behavior after the above interventions were initiated.

The children who received a combined intervention approach (44%/n=4) of stimulant medication, environmental modification and counseling overall had lower scores for the Hyperkinesis Index and lower mean severity scores on the HSQ than the children (22%/n=2) who received stimulant medication as primary intervention. The number of problem situations on the HSQ was unaffected by the intervention utilized.

The lower scores on the mean severity score of the HSQ

for the children (n=4/44%) who received a combined intervention approach compared to the children receiving only stimulant medication (n=2/22%) support the hypothesis that the combined intervention group had better outcomes than the group receiving stimulant medications as their primary intervention. Statistical significance could not be determined due to the limited number of children in each group and the small nonrandom sample.

The five parents who responded to the question on behavior change all reported marked improvement in their child's behavior. One mother noted her son stayed on tasks for longer periods of time and was more coordinated physically. She also reported he, "can be rebellious, obstinate and sassy," but commented he had also developed precocious puberty at the age of 8 years.

Four parents mentioned educational placement and future academic potential as concerns for their child. One mother stated she would like to see her son, "mainstreamed for social reasons."

Finances were expressed by one mother as of concern. "Although some of the medication and psychological costs are covered by our health insurance, I still need to spend at least \$2000 a year on uninsured medical and prescription bills."

One mother mentioned concern as to her son's future. "One does not outgrow ADD and I worry about problems in adolescence and adulthood."

One mother described, "Many concerns. I have found and continue to find such ignorance that his care has been no care in many ways--because no one wants to diagnose or treat before

5 years."

Discussion

This nonexperimental, retrospective study was designed to compare the outcomes of children with ADHD treated with stimulant therapy and children treated with combined intervention (stimulant medication, environmental modification and counseling). Through descriptive data analysis, including means and percentages, the combined approach was related to a better outcome than stimulant medication used in isolation.

Barkley (1977) emphasized that while stimulant medications facilitated the short term management of hyperactive children, when used in isolation, they have little impact on long term social, academic or psychological adjustment of these children.

The findings were similar to those of Barkley (1981) who observed the number of problem situations was not affected but the severity scores across ratings were significantly reduced after initiation of treatment for hyperactivity.

The lower mean severity scores on the HSQ in children who received combined intervention compared to the children receiving only stimulant medication reflects an improvement of symptoms related to their hyperactivity. Cause and effect as well as long term outcomes cannot be determined due to the descriptive study design. Also, lack of pre-treatment data in 88 percent (n=8) of the children and convenience sampling cannot rule out the effects of extraneous variables on the results obtained.

The problems of ADHD children are profound and long lasting (Baren, 1989). Stimulant medication cannot solve them all. The most promising therapeutic results have emerged from short term (three year) observations of children receiving multimodality treatment. Satterfield and colleagues (1981) conducted a prospective study of 100 hyperactive boys involved in a comprehensive treatment program of psychotherapy, educational intervention and medication. The outcome after three years was compared for 44 patients who dropped out of treatment and 56 who received two or three years of treatment. The second group was found to be further ahead in education, demonstrated less antisocial behavior, were more attentive and had better adjustment at home (Satterfield et al., 1981).

While the HSQ (Barkley, 1981) and the Abbreviated Parent Questionnaire (Goyette, Conners & Ulrich, 1978) provided important data for this study, also beneficial were the written comments of the parents.

Four parents mentioned educational placement and future academic potential as concerns. One parent expressed the desire to mainstream her son, "for social reasons."

Weiss and Hechtman (1986) reported children with hyperactivity experienced difficulty with academic underachievement and peer relationships.

Pelham and Bender (1982) also observed children with ADHD demonstrated extreme difficulties in their relationships with parents, siblings, teachers and peers. They emphasized peer relationships have been shown to have a critical role in

socialization and are believed to be important predictors of adult adjustment.

Financial concerns were expressed by one mother.

"Although some of the medication and psychological costs are covered by health insurance, I still need to spend at least \$2000 a year on uninsured medical and prescription bills."

Research on children with ADHD has shown children have better long term outcomes when medication is combined with behavioral/environmental therapies. Financial cost of treatment and their implications to the family are issues not frequently addressed. However, as noted by one parent in this study, the use of combined psychological intervention with other medical management also involves a question of finances. Families may not be able to afford this approach, school systems may not be able to participate (if understaffed and without adequate resources) and insurance companies often do not reimburse fully for behavioral/psychological problems.

Another mother expressed concern about her son's future. "One does not outgrow ADHD and I worry about problems in adolescence and adulthood."

Hechtman and colleagues (1984) reported that adolescents, even those treated with stimulant medication in childhood, continued to have problems with restlessness, impulsivity, concentration and immaturity. Many adolescents continued to demonstrate poor self confidence and poor self esteem.

One mother described, "many concerns." "I have found and continue to find such ignorance that his care has been no care

in many ways--because no one wants to diagnose or treat before 5 years [of age]."

Although, hyperactivity is usually diagnosed when children cannot conform to the demands of a classroom, clinical histories suggest that many hyperactive children are perceived as active, irritable and difficult to control from infancy to toddler age (Campbell, Breaux & Szumowski, 1984). Barkley (1981) suggested hyperactivity was best described as a developmental disorder with early onset and a predictable course. The symptoms exhibited change as a function of age.

Limitations

Demographic information from the study participants revealed the majority of respondents were well educated--66 percent had completed college. Twenty-two percent (n=2) of the participants were R.N.'s, 11 percent (n=1) was a human service consultant and 11 percent (n=1) was an audiologist. The findings from this study can only be generalized to a sample population similar in characteristics (including education) to this population.

Use of questionnaires and the return rate of 38 percent also limit generalization of these findings to a larger population.

Finally, causation cannot be determined secondary to use of a convenience sample without experimental intervention and absence of baseline data in 88 percent (n=8) of the subjects.

Implications and Recommendations

The implications of this research have suggested that within

this sample population, children treated with combined intervention of medication, psychotherapy/counseling and environmental modifications have better outcomes than when stimulant medication is utilized as the primary intervention. There are a number of direct and indirect implications for nursing that developed from analysis of the data.

From a direct care perspective, parents may benefit from findings from the Home Screening Questionnaire (HSQ. Barkley, 1981). The HSQ can be utilized to identify specific patterns of situational variation in children's behavior. This can contribute to better understanding of the individual factors that may precipitate or exacerbate a child's problem behavior. Interventions can then be planned to help the child adapt to the environment in more positive and socially acceptable ways.

The effect of ADHD on academic achievement and social interaction cannot be minimized. More adolescents with hyperactivity fail academic subjects, have disputes with teachers and peers, and drop out of school than other adolescents (Klein, 1987). The development of antisocial behavior by these children must be avoided. The ultimate goal is the child's attainment of his or her highest possible level of educational preparation and attainment of a satisfactory social life (Castiglia, 1990).

From an indirect perspective, further research is indicated on etiology, definition as well as different approaches to treatment. Longitudinal designs with both experimental and control groups are needed in further

research to evaluate outcomes of hyperactivity in adolescents and early adulthood.

The majority of research on ADHD supports use of a multimodal or combined approach (stimulant medication, environmental modification and psychotherapy or counseling), however, many experts continue to disagree on definition, etiology and treatment for this disorder. This research effort attempted to confirm that a combined approach in treatment resulted in better outcomes than primary stimulant medication by evaluating parental perceptions of their child's behavior. While these findings cannot be generalized beyond this particular sample, the data obtained is consistent with the majority of current literature on hyperactivity. Nurses can use this information in planning comprehensive care for the child with ADHD within his/her family and community.

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Appendix

Dear Parent,

I am a registered nurse attending graduate school at Boston College School of Nursing. As part of my educational requirements I am conducting a research study. This study will examine the forms of treatment utilized in children with attention deficit disorder and the outcomes after treatment.

Attention Deficit Disorder is a childhood syndrome characterized by developmentally inappropriate degrees of inattention, impulsiveness and hyperactivity. Children with this disorder generally display some disturbances in each of these areas but to differing degrees.

You were selected as a possible participant in this study because your child was evaluated at the Shriver Center in Waltham Massachusetts. Enclosed you will find a survey and questionnaire about your child's behavior since his/her last evaluation. I am very interested in your responses because it would help to gather information which might be useful to other parents and other children.

Your participation in the study is completely voluntary. There is no cost to you to participate in the study.

If you are interested in participating, I would greatly appreciate your completing the attached questionnaires and sealing them in the enclosed envelope. The questionnaire and survey will take approximately 15 to 30 minutes to complete, and there will be no further commitment on your part. Please return both within two weeks in the envelope provided. I will try to contact you by phone to answer any additional questions you may have.

Your name will not appear on the questionnaire or within the results of the study. The questionnaires will be coded so that identification of the children will not be possible. The collected information will not be released by anyone without your expressed written consent nor will it be placed among your child's medical records. You retain the right to withdraw your participation from the study at anytime without affecting your rights to quality health care for yourself and your family.

I have read the above letter of consent and I understand the rights and benefits. A duplicate copy of this letter is enclosed for you to keep. I agree to participate.

Date: 30 Jan. 91. Signed: Bonnie A. Feld
(Investigator)

Date: _____ Parent or Guardian: _____
(Relationship to patient) _____

If you should have any questions about the study, please feel free to call me collect at 508-653-5534.

Thank you for your time and participation.

If you are interested in receiving a copy of the study results please check _____ (yes) and provide your mailing address on reverse side

Before completing the questionnaire, please answer the following questions:

1. Who is completing the survey? Mother _____
Father _____
Both _____
2. Child's age _____ Grade _____
3. Mother's age _____ Father's age _____
4. Marital status _____
5. Mother's occupation _____
6. Father's occupation _____
7. What is the highest level of education you have completed?
Mother: 1. No formal education 2. Grade school 3. Some high school 4. Finished high school 5. Some college 6. Finished college 7. Graduate level
Father: 1. No formal education 2. Grade school 3. Some high school 4. Finished high school 5. Some college 6. Finished college 7. Graduate level
7. Please give the ages of all the children in your family.
8. Others in the home. Please include relationship to your child and their age.
9. After your child's evaluation at the Shriver Center was he/she referred to another provider or specialist? If so, what was the provider's specialty?
10. What type of treatment was recommended and implemented for your child? How long did your child receive treatment (number of years)?
11. Have there been any behavior changes in your child since his/her last evaluation? If so, please describe them (include both positive as well as negative changes if either have occurred in this period).
12. Do you have any other concerns about your child and his/her care?
(May use reverse side if necessary).

THANK YOU!

HOME SITUATION QUESTIONNAIRE

Does your child present any behavior problems in any of these situations? If so, indicate how severe they are.

Situation	Yes/No (circle one).	If yes, How Severe? (circle one)								
		Mild					Severe			
When playing alone	Yes/No	1	2	3	4	5	6	7	8	9
When playing with										
other children	Yes/No	1	2	3	4	5	6	7	8	9
When at meals	Yes/No	1	2	3	4	5	6	7	8	9
When getting dressed	Yes/No	1	2	3	4	5	6	7	8	9
When washing/bathing	Yes/No	1	2	3	4	5	6	7	8	9
When you are on the										
telephone	Yes/No	1	2	3	4	5	6	7	8	9
When watching TV	Yes/No	1	2	3	4	5	6	7	8	9
When visitors are										
in your home	Yes/No	1	2	3	4	5	6	7	8	9
When you are visiting										
someone else	Yes/No	1	2	3	4	5	6	7	8	9
When in supermarkets,										
stores, church,										
restaurants or other										
public places	Yes/No	1	2	3	4	5	6	7	8	9
When asked to do										
chores at home	Yes/No	1	2	3	4	5	6	7	8	9
When going to bed	Yes/No	1	2	3	4	5	6	7	8	9

Situation	Yes/No	If Yes, How severe? (Circle one)								
	(Circle one)	Mild					Severe			
When in the car	Yes/No	1	2	3	4	5	6	7	8	9
When with baby-sitter	Yes/No	1	2	3	4	5	6	7	8	9
When at school	Yes/No	1	2	3	4	5	6	7	8	9
When asked to do school homework	Yes/No	1	2	3	4	5	6	7	8	9

Barkley Home Situation Questionnaire. Barkley, R.A. (1981).

Hyperactive Children: A Handbook for Diagnosis & Treatment.

N.Y.: Guilford Press, p. 133. Used with permission.

CONNER'S ABBREVIATED PARENT-TEACHER QUESTIONNAIRE

Child's age_____. Child's sex: M/F.

Completed on date_____ by_____ (specify if mother, father or other caretaker).

Instructions: Please check the column which best describes your assessment of your child's behavior: Not at all, Just a Little, Pretty Much, or Very Much. Please complete all 10 items.

DEGREE OF ACTIVITY

	Not	Just a	Pretty	Very
OBSERVATION	at All	Little	Much	Much

1. Restless or overactive
2. Excitable, impulsive
3. Disturbs other children
4. Fails to finish things he/she starts. Short attention span.
5. Constantly fidgeting
6. Inattentive, easily distracted
7. Demands must be met immediately
--easily frustrated
8. Cries often and easily.
9. Mood changes quickly & drastically
10. Temper outbursts, explosive unpredictable behavior.

Conners, C.K. (1974) Conner's Abbreviated Parent-Teacher Questionnaire.
Psychopharmaceutical Bulletin, 222.

Table I
Demographic Factors

Participants

Mothers	90%
Fathers	10%
Both	0%

Marital Status

Married	80%
Divorced	20%

Paternal Age	
Range	31-45
Mean	40
Mode	43

Paternal Education	
High School graduate	30%
Some college	10%
College graduate	10%
Graduate school	50%

Maternal Age	
Range	30-48
Mean	39.3
Mode	41

Maternal Education	
High school graduate	30%
Some college	10%
College graduate	30%
Graduate school	20%

Children's sex

Male	100%
------	------

Children's Age

Range	5-12 yrs
Mean	8.6
Mode	7

Children's Grade Level

Range: Kindergarten to sixth grade

Siblings

Children with older siblings	44%
Children with younger siblings	22%
Children with no siblings	33%

Table II
Summary Data from HSQ & Abbreviated Parent Questionnaire

Child	Age	HSQ mean	HSQ # situations	Hyperkineses Index	Stim.med	Combined Treatment
#1	8	6	16	26	yes	No
2	10	6	6	12	No	Yes
3	11	4	12	16	yes	Yes
4	7	1	2	12	No	Yes
5	5	8.16	12	18	Yes	No
6	7	8	16	27	Yes	Yes
7	12	4	15	21	Yes	Yes
8	10	2.3	11	11	Yes	Yes
9	9	5.73	15	19	Yes	Classrm. Modified

Received only stimulant Medication

#1	8	6	16	26
#5	5	8.16	12	18

Modified environment only

#2	10	4.3	6	12
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Combined Interventions of Stimulant Med., Environmental Measures and psychotherapy

#3	11	4	12	16
6	7	8	16	27
7	12	4	15	21
8	10	2.3	11	11

Environmental Modification & Psychotherapy (No medication)

#4	7	1	2	12
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Received Environmental Modification & Med. (No psychotherapy)

#9	9	5.73	15	19
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Table III
HOME SCREENING QUESTIONNAIRE

Mean Severity Scores

